Chapter I

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Background

As of June 1994, state and local environmental agencies across the nation have reported more than 260,000 releases from leaking underground storage tanks. Still the number of confirmed releases continues to grow, with over 1,000 new releases reported each week. This burgeoning number of releases has created a growing and, in many cases, unmanageable workload for state regulators who often must oversee 50 to 400 cleanups at a time.

To compound the problem, these cleanups are expensive. Costs of remediating sites with soil contamination generally vary between $10,000 and $125,000. Depending on the extent of contamination, costs for remediating sites with groundwater contamination can range from $100,000 to over $1 million.

A primary factor in the high cost of cleanups is the use of ineffective cleanup methods. Pump-and-treat, the most commonly used method for remediating groundwater, often results in unsuccessful cleanups. Even when properly operated, pump-and-treat systems have inherent limitations: They do not work well in complex geologic settings or heterogeneous aquifers; they often stop reducing contamination long before reaching intended cleanup levels; and they often make sites more difficult to remediate by smearing contamination across the subsurface. Landfilling, the most frequently used method for addressing contaminated soils, does not remediate soils; this method simply moves the problem from one location to another. In addition to being costly in many states, transporting contaminated soil off-site increases the risk of harming human health and the environment.

With so many sites requiring remediation at such an enormous cost, the Environmental Protection Agency (EPA) is promoting faster, more effective, and less costly alternatives to traditional cleanup methods. EPA's Office of Underground Storage Tanks (OUST) is working with state and local governments to encourage the use of cleanup technologies that are proven but are not yet widely used. These "alternative technologies" have the ability to make cleanups faster, more effective, and less costly than traditional options such as pump-and-treat or excavation and disposal in a landfill. The U.S. EPA encourages state regulators to consider alternative cleanup technologies for remedial actions at all leaking underground storage tank sites.

Purpose Of This Manual

The purpose of this manual is to provide you—state and local regulators—with guidance that will help you review corrective action plans (CAPs) that propose alternative cleanup technologies. The manual does not advocate the use of one technology over another; rather it focuses on appropriate technology use, taking into consideration site-specific conditions and the nature and extent of contamination. While the manual focuses on the remediation of leaking underground storage tank sites, some of its basic concepts can be applied at hazardous substance and hazardous waste sites as well.

The manual is designed to enable you to answer two basic questions when reviewing a CAP:

❍ Has an appropriate cleanup technology been proposed?

❍ Does the CAP provide a technically sound approach to the cleanup?

Scope And Limitations

This manual is intended to provide technical guidance to state regulators who oversee cleanups and evaluate CAPs. The document does not represent the issuance of formal policy or in any way affect the interpretation of the regulations.

The text focuses on engineering-related considerations for evaluating each technology. It does not provide instruction on the design and construction of remedial systems and should not be used for designing CAPs. Nor should it be used to provide guidance on regulatory issues such as securing permits and establishing cleanup standards, health and safety issues, state-specific requirements, or cleanup costs.

This document is not intended to be used as the sole reference for CAP review. Rather, it is intended to be used along with published references, guidance from others more experienced with alternative technologies, information from training courses, and current journals.

The material presented is based on available technical data and information and the knowledge and experience of the authors and the peer reviewers.

How To Use This Manual

We encourage you to use this manual at your desk as you review CAPs. We have designed the manual so that you can tailor it to meet your state's or your own needs. The three-ring binder allows you to insert additional material and remove certain tools (e.g., flow charts, checklists) for photocopying. Add your own notes or information to the margins provided.

The manual contains discussions of eight different alternative cleanup technologies. Tabs signal the beginning of each chapter (including the Introduction and Abbreviations And Definitions) so you can flip quickly to the appropriate section. We have included a table of contents in each chapter to help you locate the information you need.

Each technology chapter contains the following tools which can help expedite and/or improve the review process:

- An evaluation process flow chart, the third exhibit in each chapter, can help you understand the overall review process for each technology. This flow chart serves as a "road map" for the chapter and for the decisions you will make during the evaluation process.

- A checklist, located at the end of each chapter, can help you determine whether or not the CAP contains all of the necessary information. The checklist lists the most important factors to evaluate for the successful implementation of each technology.

- A list of current references, located near the end of each chapter, provides sources of additional information.
  advantages and disadvantages of each technology, initial screening criteria, and other data specific to each technology.

Please note the evaluation form located at the end of the manual. We are very interested in your comments on the usefulness of this document. OUST relies on your feedback to improve our products. Please fill out the form and return it to us.

How to Obtain Additional Copies of the Manual

OUST plans to make this manual available through the Government Printing Office. To obtain the information you will need to order copies, please call EPA's RCRA/Superfund Hotline. The Hotline is open Monday through Friday from 8:30 to 7:30 p.m. EST. The toll-free number is 800 424-9346; for the hearing impaired, the number is TDD 800 553-7672.